

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
24 June 2004 (24.06.2004)

PCT

(10) International Publication Number  
**WO 2004/053021 A1**

(51) International Patent Classification<sup>7</sup>: **C09K 19/46**,  
19/02, G02F 1/1337

Clifford [GB/GB]; The Old Granary Crowcroft, Leighsinton WR13 5ED (GB). **BELDON, Steve** [GB/GB]; Bridge Street 35, Ledbury Herefordshire HR8 2AH (GB).

(21) International Application Number:  
PCT/EP2003/012953

(74) Common Representative: **MERCK PATENT GMBH**;  
Frankfurter Strasse 250, 64293 Darmstadt (DE).

(22) International Filing Date:  
19 November 2003 (19.11.2003)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
02027744.8 11 December 2002 (11.12.2002) EP

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): **MERCK PATENT GmbH** [DE/DE]; Frankfurter Strasse 250, 64293 Darmstadt (DE).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **FRANCIS, Matthew** [GB/GB]; 21 Stratford Place, Eastleigh SO50 4NB (GB). **GOULDING, Mark, John** [GB/GB]; 50 Seymour Road, Ringwood, Hampshire BH24 1SH (GB). **IONESCU, Doina** [RO/GB]; 34B, Oakmount Avenue, Southampton, Hampshire SO17 1ED (GB). **SCHOTT, Cecile** [FR/GB]; Flat 8 Wickham House, 91 Westridge Road, Southampton, SO17 2HJ (GB). **JONES, John**,

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: LIQUID CRYSTAL COMPOSITION FOR USE IN BISTABLE LIQUID CRYSTAL DEVICES

(57) Abstract: The invention is directed to the use of a liquid crystal composition in a bistable liquid crystal device and especially in a zenithal bistable nematic liquid crystal device, a nematic liquid crystal medium, and a bistable liquid crystal device comprising the liquid crystal composition whereby said liquid crystal composition comprises at least 30 weight% (based on the total weight of the composition) of a component ( $\alpha$ ) containing one or more compounds having a dielectric anisotropy  $\Delta\epsilon$  of at least 25, whereby at least 25 weight% (based on the total weight of the composition) of said compounds have a dielectric anisotropy  $\Delta\epsilon$  of at least 40; and at least 5 weight% of a component ( $\beta$ ).

WO 2004/053021 A1

**Abstract**

The invention is directed to the use of a liquid crystal composition in a bistable liquid crystal device and especially in a zenithal bistable nematic liquid crystal device, a nematic liquid crystal medium, and a bistable liquid crystal device comprising the liquid crystal composition whereby said liquid crystal composition comprises at least 30 weight% (based on the total weight of the composition) of a component ( $\alpha$ ) containing one or more compounds having a dielectric anisotropy  $\Delta\epsilon$  of at least 25, whereby at least 25 weight% (based on the total weight of the composition) of said compounds have a dielectric anisotropy  $\Delta\epsilon$  of at least 40; and at least 5 weight% of a component ( $\beta$ ).